Notice of Allowability	Application No.	Applicant(s)	
	10/649,950	AMOU ET AL.	
	Examiner	Art Unit	
	Henry S. Hu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Pre-Amendment of August 28, 2003*.

2. ☒ The allowed claim(s) is/are *9-14*.

3. ☒ The drawings filed on *28 August 2003* are accepted by the Examiner.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 9-23-2003
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with **Mark J. Thronson (tel. 202 785-9700) and Pete A. Veytsman (registration # 45920, tel. 202 777-2592) on March 16, 2005** to amend the specification as following:

SPECIFICATION

page 9 at line 16 replace the word of "1,2-bisvinylphenylethane" with "1,2-bis(vinylphenyl)ethane"

page 12 at line 22 replace the word of "pp23" with "p. 23"

page 29 at line 13 replace the word of "1,2-bisvinylphenylethane" with "1,2-bis(vinylphenyl)ethane"

DETAILED ACTION

2. It is noted that this application is **a DIV of 09/951,414, now US Patent No. 6,756,441**. This Office Action is in response to the Pre-Amendment filed on August 28, 2003. Claims 1-8 were canceled. Claim 8 was rewritten as a new independent Claim 14. Claim 9 became dependent from Claim 14. Claim 12 was only amended to correct a typographical error on "polymer". The above examiner's amendment has further corrected some improper language. **Claims 9-14 are now pending.** The examiner **accepts Applicants' drawing sheet with Figures 1 and 2** filed on August 28, 2003 with this application. An action follows.

Allowable Subject Matter

3. Claims 9-14 are allowed.

4. The following is an examiner's statement of reasons for allowance: The above claims 9-14 are allowed over the closest references:

5. *The limitation of parent **Claim 10** of present invention relates to a curable film which contains a crosslinking component having **a weight average molecular weight of no more than 1,000 and a plurality of styrene groups and represented by the formula [1]**, and further contains **a high polymer** having film-forming ability. Parent **Claims 12 and 13** relate to making an electrical part having an insulator layer containing the cured product of Claim 10; parent*

***Claim 14** relates to a cured product of Claim 10 with a high polymer having a weight average molecular weight of not less than 5,000 and a filler. See other limitations of dependent **Claims 9 and 11**.*

6. In view of the Applicants' pre-amendment, all parent **Claims 10, 12, 13 and 14** of present invention have the specific limitation on crosslinking component as "**having a weight average molecular weight of no more than 1,000 and a plurality of styrene groups and represented by the formula [1]**". It is noted that a closed language of "**contain**" is used in the composition. In comparison with parent **Claim 10**, parent **Claims 12 and 13** relate to making an electrical part having an insulator layer containing the cured product of Claim 10, while parent **Claim 14** relates to a cured product of Claim 10 with a high polymer having a weight average molecular weight of not less than 5,000 and a filler.

7. **As discussed in the notice of allowability for the parent application 09/951,414**, **Yamada** et al. (US 6,420,476) only disclose that a composite composition having a low dielectric loss tangent comprises a heat-resistant, low-dielectric polymeric material and filler. The polymeric material is a thermoplastic copolymer in which a non-polar α-olefin base (co)polymer segment is chemically combined with a vinyl aromatic (co)polymer segment, wherein the non-polar α-olefin base is a hydrocarbon polymer as specified on column 7 at line 34-49, and vinyl aromatic (co)polymer is divinylbenzene-containing. In the course of preparing the above polymeric material, the non-polar α-olefin base (co)polymer is impregnated with the vinyl monomer and radical polymerization initiator. In a close examination on **column 6, lines**

16-19 as specifically pointed out by the Applicants on page 5 in the middle section, **Yamada (476)'s preferable resin has the weight average molecular weight of 1,000 or more, otherwise it becomes volatile in the process**.

8. **Yamada** et al. (US 6,500,535) has the same problem. In a close examination on **column 5, lines 28-31** as specifically pointed out by the Applicants on page 7 at the top section, **Yamada (535)'s resin has the weight average molecular weight of 1,000 or more, preferably 3,000 or greater, otherwise it becomes volatile in the process**.

Sakamoto et al. (US 4,874,826) only disclose that a method of preparing polyphenylene oxide composition and laminates having a low dielectric constant and loss, wherein the composition comprises PPO mixing with a crosslinking monomer, or a crosslinking polymer or the mixture thereof as well as an inorganic filler. Styrene-containing monomer or its copolymer with unsaturated double bond (STP) can be used. Sakamoto et al. furthermore disclose STP is a styrene-butadiene-block copolymer or styrene-isoprene-block copolymer or the like. In a close examinatio, **Sakamoto's crosslinking component carries a weight average molecular weight of 1,000 or more in view of the above resin component.**

9. **Zannoch** et al. (US 6,521,703) only discloses that a method of preparing a curable resin composition "**comprising" an alkenyl aromatic compound, a capped poly(arylene ether) and a filler**. It is noted that the alkenyl aromatic compound is a **polyfunctional styrene monomer** as specified on column 3, line 25 – column 4, line 2 **does not reads on the claimed structure in**

formula (1) of present invention in view of the structure. Additionally, Zannoch's mixed resin composition will not obtain a low dielectric loss tangent as **present invention containing the claimed styrene component**, **while Zannoch's composition has much less content of styrene unit**.

Brenner (US 4,049,750) only discloses that a catalyst such as peroxide type polymerization initiator can be used together with an inhibitor such as quinones as such a mixture is useful in one-component shelf stable low shrinkage structural adhesive system. **Gaddam** et al. (US 6,448,301) only discloses that radical polymerization inhibitors is required at the processing temperature of 70 °C and above for radical-induced polymerization in order to help the radical polymerization proceeding to a virtual completion.

10. With respect to the seven references cited in IDS of September 23, 2003, the examiner has found the following: **JP-11-060519 to Kubota** et al. (the **A** reference) only discloses the preparation of halogenalkyl-containing styrene derivatives by Gregnard reaction. **JP-09-031006 to Otani** et al. (the **B** reference) only discloses the preparation of **vinylbenzyl**-containing polymeric compounds; it is different from the claimed styrene compound. Additionally, no molecular weight is given at all. **Polymer Letters** (the **C** reference) only discloses the traditional free radical polymerization process of cyclophanes in a reactor and **not on the substrate to form a film** (see pages 85 and 86).

Polymer for Advanced Technologies to **Barton** et al. (the **D** reference) only discloses the polymerization process of **vinyl terminated oligomer** with some required aromatic diamine to form a film (see pages 245-246). It is quite different from Claim 1 in which contains only the styrene derivative with a high polymer. **Polyfile** (the **E** reference with translation) to **Ohtani** only discloses the polymerization process of **vinyl-terminated compound (VB)** with some required maleimide to form a film (see pages 1 and 2). **Makromol. Chem.** to **Nagasaki** et al. (the **F** reference) only discloses the preparation of poly(divinyl-benzene), which has a molecular weight of 1,000 to 3,000 (page 36). **J. Polym. Sci**. (the **G** reference) to **Li** et al. only discloses the preparation of poly(BVPE) by suspension polymerization in a reactor and **not on the substrate to form a film** (page 2026).

In a close examination, all the above-mentioned references either use a crosslinking component having a molecular weight of more than 1,000, or require to be mixed the claimed monomer with other reactive compound, or can not form a film on the substrate directly, or do not mix a high polymer together. Additionally, the present invention has shown in examples along with some comparative examples for unexpected results in obtaining a cured product using a low dielectric loss tangent resin composition (see pages 23-34 for **examples 1-6 along with its control examples 1-3, and Tables 1-2**). Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention.

11. After further examination and search, the examiner found the following prior art did not teach the claimed limitation: US Patent No. **6,201,035 to Tuinman** discloses a method for the

formation of a flexible slabstock polyurethane foam by formimg a polyol blend having a nominal functionality (abstract, line 1-8). Although a plurality of styrene and acrylonitrile may be polymerized onto the internal block (column 12, line 43-44; column 14, line 23-24), **no claimed crosslinking component is disclosed, and no high polymer is mixed.** Therefore, Tuinman fails to teach or fairly suggest the limitation of present invention.

12. The two key issues, regarding (A) a resin composition "**containing**" a crosslinking component and a high polymer, and (B) such a crosslinking component "**has a weight average molecular weight of no more than 1,000 and a plurality of styrene groups and represented by the formula [1]**", cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

13. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, the four independent and parent **Claims 10, 12, 13 and 14** are allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending dependent **Claims 9 and 11** are passed to issue.

14. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

15. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Henry S. Hu whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

March 16, 2005

DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700